

## Patent claims:

1. Process for the preparation of enantiomerically enriched organic compounds in a coupled enzymatic reaction system, comprising a first enzymatic transformation of an organic substrate, NAD(P)H being consumed, and the regeneration of the NAD(P)H in a second enzymatic transformation by a malate dehydrogenase, with oxidation of L-malic acid to pyruvate and CO<sub>2</sub>,  
5 characterized in that  
10 the pyruvate formed from the second enzymatic transformation is not employed as the substrate in the first enzymatic transformation.
2. Process according to claim 1,  
15 characterized in that  
the first enzymatic transformation proceeds using an alcohol dehydrogenase or amino acid dehydrogenase.
3. Process according to claim 2,  
20 characterized in that  
an ADH from *Lactobacillus kefir* or *Rhodococcus erythropolis* is used as the alcohol dehydrogenase and a leucine dehydrogenase or phenylalanine dehydrogenase is used as the amino acid dehydrogenase.
4. Process according to one or more of the preceding  
25 claims  
characterized in that  
a malate dehydrogenase from *E. coli*, in particular *E. coli* K12, is used.
5. Process according to one or more of the preceding  
30 claims  
characterized in that  
the reaction is carried out in an aqueous single- or multi-phase solvent mixture.

6. Process according to one or more of the preceding claims,  
characterized in that  
the temperature during the reaction is between 20 and  
40°C.
7. Process according to one or more of the preceding claims,  
characterized in that  
the pH during the reaction is between 6 and 9.
8. Coupled enzymatic reaction system for the preparation  
of enantiomerically enriched organic compounds,  
comprising a first enzymatic transformation of an  
organic substrate, NAD(P)H being consumed, and the  
regeneration of the NAD(P)H in a second enzymatic  
transformation by a malate dehydrogenase, with  
oxidation of L-malic acid to pyruvate and CO<sub>2</sub>,  
characterized in that  
the pyruvate formed from the second enzymatic  
transformation is not employed as the substrate in the  
first enzymatic transformation.
9. Whole cell catalyst comprising a cloned gene for a  
first enzyme for transformation of an organic  
substrate and a cloned gene for a malate  
dehydrogenase, this being capable of preparation of an  
enantiomerically enriched organic compound in a first  
enzymatic transformation, NAD(P)H being consumed, and  
of allowing the regeneration of the NAD(P)H to take  
place in a second enzymatic transformation by malate  
dehydrogenase, with oxidation of L-malic acid to  
pyruvate and CO<sub>2</sub>, wherein the pyruvate formed from the  
second enzymatic transformation is not employed as the  
substrate in the first enzymatic transformation.
10. Plasmids containing gene constructs in which the gene  
for a malate dehydrogenase and a gene for an enzyme

for transformation of an organic substrate with consumption of NAD(P)H are present.